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17. ABSTRACT (MAX. 250 WORDS) A generalized discussion of instructional technology and a review of specific methods, materials, and equipment that apply to teaching, particularly speech teaching, are presented.

Instructional technology is the combination of science and engineering to solve an educational problem. It involves new methods of organizing and presenting information, and new or revised techniques, materials, and equipment to serve specific learning needs. Careful analysis of learning objectives and the subject matter to be taught is necessary for optimum programing. New concepts of administration are needed to overcome the lack of proper training, programing, and maintenance of technological aids by individual schools. The systems approach, in which all materials relevant to a particular lesson unit are packaged together, is one solution to such problems.

The present trend in teaching methods toward the fusion of small group, large group, and conventional classroom instruction into an instructional system has been influenced by instructional technology. Tutorial or laboratory situations are geared toward specific learning needs of individual students, allow behavior to be shaped within closer limits than is possible with group teaching, and give the student immediate knowledge of results. Students can master the material at their own rates. Tape recorders aid in learning spoken language and pronunication. A trend in materials, brought about by the new technology, is towards increased use of prepared materials that are integrated with curriculum and lesson plans. Students work with the materials individually or in small groups. Textbooks are being supplemented with such materials as workbooks, programed texts, films, filmstrips, and recordings. The trend in equipment is toward permanent installation. Use of equipment and materials is determined by their availability, accessibility, and simplicity of use.

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INSTRUCTIONAL TECHNOLOGY - U.S.C.

TECHNOLOGY AND ITS APPLICATION TO SPEECH EDUCATION - AN OVERVIEW

by

Don Perrin

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A Paper Presented to Dr. Richards
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TECHNOLOGY AND ITS APPLICATION TO SPEECH EDUCATION - AN OVERVIEW

We are now entering the space age, yet modern education does not reflect the spectacular changes evident in the everyday world. A tradition bound educational system may be partly to blame, but the basic problem is the slow development of the social sciences as compared to the physical sciences, so that the mysteries of the physical universe seem much more available to us than an understanding of human nature. Despite significant advances in psychology, sociology, communications, and learning theory, relatively little is known about the learning process. We cannot measure human behavior with the degree of precision that an atom can be measured, nor can we accurately control and predict learning behaviors. However, means do exist to communicate more effectively, and also to improve retention of what is learned. Many of the principles are derived from psychology; their application is being fostered by a new field called instructional technology.

Technology is the combination of science and engineering to solve a problem. If the problem is to cross a river we might build a bridge. If the problem is a shortage of teachers (and the National Education Association informs us we will be short 250,000 qualified teachers by 1965) then we will either get more teachers, or seek means of using those we have more efficiently. Instructional technology involves

new methods, materials, and sometimes equipment. It is not a conspiracy to mechanize the school and replace teachers; it is a realistic approach to the need for increased learning in a period when teachers are in short supply.

The problem is complicated by the twin explosions of information and population. Eight or even twelve years of schooling is no longer adequate, and people are constantly returning to school for retraining and enrichment through adulthood and old age. The knowledge of the world is growing exponentially, and it is no longer possible for any one human being to know more than a very small part of it. This leads to specialization and a growing complexity which presents its own problems - problems in communication, organization, and conceptualization which specialists in the communication sciences (including Speech) will be called upon to solve. The population explosion is creating a different kind of problem - overcrowded school buildings, shortages in teachers, materials, and equipment, with insufficient funds to make good these deficiencies. With more students to learn more information from (relatively) less teachers, more efficient means of teaching are being urgently sought.

Perhaps traditional methods of teaching where 40 students receive most of their information from the teacher's larynx are outmoded in a space age society? Methods adequate

in 1900 are not acceptable in the year 1963. It is significant that the major technological innovation in schools since the advent of the book is the chalkboard, and that the teachers principal tools are pencil, chalk, and eraser. Just as a carpenter uses chisel, saw, and hammer to accomplish specific tasks, the teacher needs an armory of tools to assist in the instructional process. A primative attempt to provide such tools has been made by "audio-visual" specialists over the past 30 years. A more integrated and practical approach is now being made by instructional technologists.

Audio-visual sought to make learning experiences more real through the use of recorded sound and pictures. It proved that sounds and images taught more efficiently than verbal descriptions in many instances, so that comprehension and retention could be increased. The early materials and equipment left much to be desired, but over the years a host of excellent materials have become available. Equipment has also undergone spectacular changes, being re-engineered for high reliability, and human engineered so as to almost self operational. The initial emphasis on "gagets" has faded away, and equipment has become a means to an end. In many instances equipment is not needed at all while in others it is indispensible. A slide projector and 30 slides can make available in minutes a set of posters which would otherwise cover all four walls and the ceiling of the classroom. Also it is much easier to store 30 slides than 30 posters.

The real problem with audio-visual was that it was something "tacked on" to education. It demanded changes in teaching and administrative techniques that the schools were not ready to make. In an era when many teachers had not learned to make good use of books in teaching, audio-visual methods were out of joint with the educational system as a whole. Many paid lip service to it while projectors and stereopticons gathered dust in the storeroom. The situation is now changing rapidly, and this is evidenced by the spectacular growth of audio-visual equipment in the Public schools since 1955.[1]

New concepts of administration are needed to accompany the new methods of instruction, and this is illustrated by the following story. The economy in Upper Vaulta was failing, and reports indicated that the major problem was transportation to the centers of trade for the produce of this territory. An American millionaire sought to correct the situation by donating 100 trucks for use in Upper Vaulta. What he did not know was that there were no roads, no service stations, and no-one with driving experience to use the trucks. Educational administrators are constantly guilty of this kind of mistake. Over the past five years nearly 10,000 schools have aquired language laboratories at an average cost of about $5,500 each. In many instances there has been no provision for training teachers to use it,

to buy materials to use with the lab., or to insure proper maintainance of the equipment. The concept of technology is so completely new to education that things like training, fuel (programs), and maintainance which we accept as necessary for our automobiles are often overlooked for educational materials and equipment. Even though we can assume a teacher can work out how to use a language laboratory, their introduction would have been much easier if a training package had accompanied the equipment. Many industrial and military organizations prefer to buy equipment as a package, including the necessary materials, training, and maintainance contracts.

Instructional technology is introducing a technique called the "systems" approach which promises to overcome such problems. For example, all materials relevant to a particular lesson unit are now being packaged together so that the teacher can undertake the necessary research and lesson preparation in minutes instead of hours. Typical packages include filmstrips, records, workbooks, and a study guide for the teacher with suggestions for lesson preparation and presentation. More elaborate kits such as the Parlon Francais course for first year French includes a set of 8mm sound motion pictures with projector, sound tapes for language lab use, books with records pressed in to some of the pages, phonograph, workbooks, study guides, etc. all packaged in a single cabinet. This package is so complete that it could probably teach French even without the assistance of a trained French teacher. Then there are

film series such as the Harvey White films in Physics and Chemistry, as broadcast over Continental Classroom. Many of these films are finding use in the classroom where qualified teachers cannot be obtained, or to supplement regular instruction when the teacher has neither the equipment or the time to set up a particular experiment.

Other "systems" approaches promise to save unnecessary human labor. Multiple choice tests can now be corrected automatically by machines costing as little as $500. Films can be distributed around a school or campus by means of television. Larger classes can be taught using modern projection and television display techniques. The influence of great teachers can now be extended by means of broadcasting, film, and television recording. Teams of teachers may be used to prepare lessons for larger groups, and where less teachers are needed for large group presentations, the amount of small group instruction can be increased to complement this. New methods of organization and new methods of teaching promise to revolutionize conventional methods of teaching in schools, and in colleges at the undergraduate level.

Special attention is now being paid to the availability of materials. Cost has for years limited the supply of motion picture films so that it is not uncommon to rent films from centralized libraries up to 1,000 miles away. Even within the

Los Angeles City school system which has more adequate film facilities than most parts of the country, it is necessary to order films a year in advance, often with considerably compromises in date so that films are rarely used at the point where they are topical and relevant. Just as books have become more freely available through paperbacks, 8mm sound films promise to reduce the cost of motion pictures to about the price of a library book. This will make it possible for each school to have its own library of films, just as many now have their own filmstrip collections.

It is interesting to compare the amount of technological equipment in the average home and the average classroom. Most homes boast a car, washing machine, radio, record player, television, and often a camera or projector of some kind. A recent survey showed the average public school classroom to have 1/4 of a record player, 1/7 filmstrip projector, 1/10 motion picture projector, 1/14 of a radio, and 1/22 of a television set. Considering that the average classroom houses eight times as many human beings as the average home, and that this kind of equipment is invaluable to instruction, the amount of equipment (with accompanying materials such as records) is very small indeed.

So far the relationship of technology to speech education has been dealt with in very general terms. The second part of this paper will now review more specific

methods, materials, and equipment as they apply to teaching in general, and to speech teaching in particular.

1. Methods

Up till 1955 the emphasis was on better group communication in the classroom with such technological assistance as public address systems, record players, tape recorders; projection devices for motion pictures, still transparencies, and opaque materials; and television which accomplished a similar function to motion pictures but with greater immediacy and presence. The 1950's also saw a trend toward individual instruction or small group instruction for classes having widely different needs and abilities. From study corners in the classroom for the student who finished early, and listening centers in the library and music room, laboratory situations have developed to foster individual study, and individual instruction, in reading skills, spoken language, and even in academic subject matter. These laboratories represent a recognition by the academic community of the limitations of group methods of instruction. The present trend is toward the fusion of small group, large group, and conventional classroom instruction into an instructional system.[2] One kind of system has been advocated and widely publicised by Lloyd Trump.[3] Other workers are attempting to formulate a generalized system plan which can adapt to the needs of any kind of learning situation.[4]

While some look at the overall organization and administration of the teaching program, other groups are looking at the subject matter and methods of teaching it in closer detail. Whole new curricula have been developed in Mathematics, the Physical Sciences, and the Biological Sciences. These are much more closely geared to the needs of modern students than was previously possible. Also, the goals of education and the specific teaching goals for any subject matter are receiving close scrutiny. Good teaching requires clearly defined objectives, and careful analysis of the information allows learning experiences to be designed (synthesised) which will achieve these objectives. A clearly expressed goal would be "to teach the addition of simple whole numbers less than ten to advanced second grade students." To say "teaching addition" is an inadequate definition since it gives no limits or boundaries. Similarly, the failings of many speech corses in High Schools lies with the lack of clearly defined and carefully weighed objectives. If the major problem is to help the students to overcome nervousness and to construct interesting two minute speeches, then teaching the history of speech would hardly be relevant. If a debater's problem is to analyse his respondents information, then some practice in information analysis should complement the debating program. Many learning needs are peculiar to the individual, so that tutorial or laboratory situations are desirable. Much class time is wasted in tutoring individuals with specific needs not relevant to the remainder of the class.

In the eyes of many scholars, individual tutoring represents the ultimate in learning, and this is reflected in the growth of tutorial systems programed onto disc records, tape recorders, programed books, and teaching machines. Most of these systems operate by providing model responses with which the student can compare his own efforts. In a few instances the machine makes the comparison, but there seems to be nothing to gain from the additional automation. Tutorial methods allow behavior to be shaped within much closer limits than is possible with group teaching, and the student benefits from immediate knowledge of results. The fast student is not held back by the class, while the less able student can master the material at his own rate. For learning spoken language and pronunciation the tape recorder is invaluable; for factual information programed materials are more efficient than textbooks, and save time and effort for the classroom teacher by anticipating the more common learning problems.

No one method of instruction seems to serve more than a part of the learning need. Just as the carpenter has different tools for specific purposes, the teacher needs a variety of tools and techniques. Lecture-demonstration, discussion, laboratory exercises, and tutoring all play an important role in the instructional program.

2. Materials.

The trend is towards increased use of prepared materials which are carefully integrated with the curriculum and lesson plans. These vary from workbooks to programed texts, from records to listen to to recordings which require the learner to overtly respond and practice skills while they are bing taught. Films which once served several grade levels are now designed for a single grade level and a specific curriculum. Short "single concept films" are beginning to fill the need for specific short examples to complement lessons in science and speech. The concepts of packaging mentioned earlier are helping to make the materials more available and easier to use. Miniaturization as with 8mm sound films is reducing cost, while self threading and cartridge lodding projectors make these materials simple to use.

As materials become more readily available in the different subject matter areas, the job of the teacher changes. Students can work with the materials individually or in small groups, and accomplish by research what was previously taught by lecture methods. Also, the close inbraction of the students with the pictures, sounds, models, and other resource materials leads to very fruitful learning experiences. Although books are still one of the most important resource materials, it is notable that many are now being supplemented with workbooks, programed texts, films,

filmstrips, and recordings. Almost every major publisher of textbooks is now diversifying the means of presentation and packaging in an effort to capitalize on these trends.

3. Equipment.

The concepts of availability which have limited the use of materials also apply to equipment. For example, it is the aim of the Los Angeles City School system to have a tape recorder in every classroom for the elementary grades. The nuisance of booking equipment and having to set it up specially for each use is causing a trend toward permanently installed equipment. Schools which have aquired television receivers usually have them permanently mounted and adjusted to suit the conditions of use. Some classrooms now have slide and motion picture projectors permanently installed, but these are still the exception rather than the rule. There is little doubt that the use of materials and equipment is determined largely by their availability and accessibility, and the simplicity of use. Schools and colleges which now use larger groups for lecture-demonstrations to set teachers free to work with small groups become highly dependent on equipment to project or magnify the relevant information. The University of Wisconsin is using a TelePrompter System which includes three screens and prepared materials on film, slides, and tape. The University of Miami recently completed a new building centered around a film and television center which can supply the needs of several classes simultaneously.

4. Some Projections for the Speech Teacher.

The next twenty years will see some spectacular changes in the way speech is taught, and the materials, equipment, and methods used by the teacher. A class might start with a short (10 minute) segment of programed learning to instill the facts necessary to that days program, followed by a short lecture demonstration including some models and a single concept film. By now the students have a common basis and the necessary information to meaningfully interact with the subject matter and each other, and a discussion ensues. This leads to breaking up into small groups for a number of research assignments, with a final reporting back to the class and summary by the teacher. Note how the teacher performs less of a communication function and more of a guidance function than at present.

Resources for research and study will be much more available to the student than ever before. The USC Department of Speech might have its own library including not only books but listening posts, teaching machines, and sound-proof rooms where debate and speaking excercises can be practiced. Also there will be a library of tapes of famous speakers and famous speeches, along with film segments and filmstrips for use by the students. A facsimile link with the L.A. City and U.C. libraries will facilitate research by graduate students. Also, and input and readout to the Computer Center will allow

students and research faculty alike to have immediate computation facilities to assist with their research projects.

A small unit within the Department of Speech will be generating special materials for use in speech classes, often with the co-operation of similar groups in the Departments of Drama, Telecommunications, Cinema, and Instructional Technology. Another group will be devoted to continual revision and refinement of curriculum, with a school research program to monitor the changing needs of students and school curricula with regard to speech. A third group might be developing more scientific tools of evaluation and measurement as a step toward a mathematical basis for comparison. Yet another group might serve a liaison function betwsen speech and other departments both in schools and on the college campus.

Instructional technology involves new methods of organization and presentation of information, and the generation of techniques, materials, and equipment to serve specific learning needs. It embodies individual instruction, conventional class groups, and large group instruction into an efficient system for learning, and is applicable to any kind of subject matter in any teaching situation. It requires a careful analysis of learning objectives and the subject matter to be taught, and an optimizing of the available tools, techniques, and talent in the total teaching program.

BIBLIOGRAPHY

1. Finn, James D. et. al. Audio-Visual Instrumentation for Instruction in the Public Schools, 1930-1960. Washington, D.C.: National Education Association, 11962.

2. Finn, James D. "New Techniques of Teaching for the Sixties," Teacher Education: Direction for the Sixties. Washington, D.C.: The American Association of Colleges for Teacher Education, 1961.

3. Trump, Lloyd J. New Directions to Quality Education: The Secondary School Tomorrow. Washington, D.C.: National Association of Secondary School Principals, 1960.

4. Silvern, Leonard C. Systems Engineering in the Educational Environment. Hawthorne, Calif: Northrop Norair 9.3.7., 1963.

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